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REMARKS

Claims 1-8, 10-13, 16, and 18-46 are pending in application, of which claims 1, 27, and 44 are independent. No claims have been added. Claims 14, 15, and 17 have been cancelled without prejudice. Claims 1, 2, 6, 10, 12, 16, 27, 28, 31, 35, 44, 45, and 46 have been amended to better claim the invention and to correct inadvertent errors. Applicant believes that the claims are in condition for allowance, which prompt and favorable action is respectfully requested.

I.   REJECTION UNDER 35 U.S.C. §103

A.   CLAIMS 1-6 and 13-26

The Examiner rejected claims 1-6, and 13-26 under 35 U.S.C. §103(a) as being unpatentable over U.S. Patent No. 6,222,835 (hereinafter "Franz") in view of U.S. Patent No. 6,499,128 (hereinafter "Gerlach"). The rejection is respectfully traversed.

Claim 1 now recites in part as follows:

"...determining the first *a priori* information for the transmitted coded bits based in part on the second *a priori* information; repeating the determining the plurality of soft decision symbols and the determining the first *a priori* information a plurality of times" (Claim 1).

Claim 1 now recites in part "repeating the determining the first plurality of soft decision symbols and the determining the first extrinsic information *a priori* information a plurality of times." The detecting and decoding process is iterative and repeated for the same transmitted bits a plurality of times in order to decode the bits.

In contrast, Franz discloses a method for using soft information to reduce the number of retransmissions of data frames that use the ARQ protocol. Franz discloses "the signal y(1) is fed to the equalizer 10 (1) ... the signal at the output of the decoder 14 (1), with its soft or hard information, is rejected in this example ... the data frame has to be retransmitted as a signal y (2) ... it can be seen from the block diagram, the interleaver 20 is used to pass the information which is present at the output of the decoder 14 (1), as a-priori information, to the input of the equalizer 10 (2)" (Col 5, lines 11-31). Franz discloses "the signal of the retransmitted data frame is always

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processed together with the information at the output of the preceding decoder, which virtually corresponds to progressive processing" (Col 5, lines 64-67). Franz discloses that if a data frame is decoded and rejected then the exact data frame is retransmitted again, and the decoded soft information used on the first transmission attempt is used to help decode the retransmitted frame. This process is "repeated for as long as the data frame is incorrect. Termination after a fixed number of repetitions ... is also possible" (Col 6, lines 21-23). Thus, if the frame is rejected it is retransmitted and the prior decoded soft information is used as a-priori information to the current received frame. Franz does not iteratively detect and decode a-priori information a plurality of times on the same transmitted bits. Thus, Franz does not disclose "repeating the determining the first plurality of soft decision symbols and the determining the first extrinsic information *a priori* information a plurality of times" as in claim 1.

Franz also discloses "both forward-progressing and rearward-progressing processing are thus possible, by the signals at the output of the decoders being fed either to one of the following equalizers" (Col 6, lines 10-13). Thus, the decoded soft information for one received fame could be "rearward-processed" and sent as a-priori information to the next incoming frame. Thus, a received and rejected frame could be used as a-priori information to a new received frame. Franz does not disclose "repeating the determining the first plurality of soft decision symbols and the determining the first extrinsic information *a priori* information a plurality of times" on the same transmitted bits as in claim 1.

Gerlach discloses a soft decision-in soft decision-out iterative decoding method for block codes on a bit by bit basis. However, Gerlach does not disclose "the plurality of modulation symbols for each receive antenna can be a respective modulation or coding scheme" as in Claim 1.

Therefore, neither Franz nor Gerlach independently or combined teach or disclose all of the limitations of claim 1. Claims 27 and 44 contain similar limitations as to claim 1, and for at least the same reasons as stated for Claim 1, claims 27 and 44 are patentable. Claims 2-6, and 13, and 18-26 depend from independent Claim 1, and are patentable for at least the same reasons as stated with respect to Claim 1.

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In addition, previous cited document US IEEE Publication VTS-2000 by Nguyen and U.S. Patent No. 6,307,882 (hereinafter "Marzeth") do not independently or combined teach or disclose all of the limitations of claim 1.

Claim 1 now recites in part as follows:
"...wherein the plurality of modulation symbols for each receive antenna can be a respective modulation or coding scheme" (claim 1).

Nguyen discloses iterative decoding for a differential space-time block code (DSTBC) in which a plurality of receive and transmit antennas are disclosed. Nguyen discloses "an alternative to channel estimation is to apply differential space-time block coding [16, 12, 10] which is similar to DPSK in single channel transmitted systems" (page 2394, Col 1, 1st paragraph). Nguyen discloses "the connection is drawn between DPSK and multiple antenna differential modulation" (Page 2395, Col 2, 1st paragraph). Basically, in a DSTBC system the first symbol and the complex conjugate of the second symbol is transmitted on one antenna, and the second symbol and the complex conjugate of the first symbol is transmitted on the second antenna. The received symbols on each receive antenna have to be combined with received symbols from the other antenna in the DSTBC decoder to provide decoded data symbols. Thus, in Nguyen each antenna does not receive symbols having a respective modulation or coding scheme and Nguyen does not teach that "the plurality of modulation symbols for each receive antenna can be a respective modulation or coding scheme" as in claim 1.

Marzeth discloses a plurality of transmit and receive antennas. Marzeth discloses "according to the invention, the receiver 18 determines components h_{mn} of a channel propagation matrix H" (Col 3, lines 9-10). Marzeth discloses "the receiver 18 responds via its antenna elements 22_n to the training signals to determine the channel propagation matrix H" (Col 3, lines 26-28). Marzeth does not disclose any type of iterative decoding method or apparatus. Thus, Marzeth does not discloses "determining the first *a priori* information for the transmitted coded bits based in part on the second *a priori* information; repeating the determining the plurality of soft decision symbols and the determining the first *a priori* information a plurality of times" as in claim 1.

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Therefore, neither Nguyen nor Marzeth independently or combined teach or disclose all of the limitations of claim 1. Claims 27 and 44 contain similar limitations as to claim 1, and for at least the same reasons as stated for Claim 1, claims 27 and 44 are patentable. Claims 2-8, 10-13, and 18-26 depend from independent Claim 1, and are patentable for at least the same reasons as stated with respect to Claim 1. Claims 28-43 depend from independent Claim 27, and are patentable for at least the same reasons as stated with respect to Claim 27. Claims 45 and 46 depend from independent Claim 44, and are patentable for at least the same reasons as stated with respect to Claim 44.

B.   CLAIMS 10, 11 AND 12

The Examiner rejected claims 10, 11 and 12 under 35 U.S.C. §103(a) as being unpatentable over U.S. Patent No. 6,222,835 (hereinafter "Franz") in view of U.S. Patent No. 6,499,128 (hereinafter "Gerlach") and in further view of Stefanov (IEEE Journal on Selected areas of Communication, vol 19, No. 5). The rejection is respectfully traversed.

Stefanov discloses a multiple transmit and receive antenna system that utilizes iterative decoding. However, Stefanov does not disclose anywhere that "the plurality of modulation symbols for each receive antenna can be a respective modulation or coding scheme" as in claim 1. As with regards to Claim 1, neither Franz nor Gerlach independently or combined teach or disclose all of the limitations of claim 1. Thus, neither Franz, Gerlach, nor Stefanov independently or combined teach or disclose all of the limitations of claim 1. Claims 10, 11 and 12 depend from independent Claim 1, and are patentable for at least the same reasons as stated with respect to Claim 1.

C.   CLAIMS 7, 8 AND 40

The Examiner rejected claims 7, 8 and 40 under 35 U.S.C. §103(a) as being unpatentable over U.S. Patent No. 6,222,835 (hereinafter "Franz") in view of U.S. Patent No. 6,499,128 (hereinafter "Gerlach") and in further view of U.S. Patent No. 2003/0076890 (hereinafter "Hochwald"). The rejection is respectfully traversed.

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Hochwald discloses a multiple transmit and receive antenna system that utilizes iterative decoding. However, Hochwald does not disclose anywhere that "the plurality of modulation symbols for each receive antenna can be a respective modulation or coding scheme" as in claim 1. As with regards to Claim 1, neither Franz nor Gerlach independently or combined teach or disclose all of the limitations of claim 1. Thus, neither Franz, Gerlach, nor Hochwald independently or combined teach or disclose all of the limitations of claim 1. Claim 27 contains similar limitations as to claim 1, and for at least the same reasons as stated for Claim 1, claim 27 is patentable. Claims 7 and 8 depend from independent Claim 1, and are patentable for at least the same reasons as stated with respect to Claim 1. Claim 40 depend from independent Claim 27, and is patentable for at least the same reasons as stated with respect to Claim 27.

D.   CLAIMS 27-30, 34-39 AND 41-43

The Examiner rejected claims 27-30, 34-39 and 41-43 under 35 U.S.C. §103(a) as being unpatentable over U.S. Patent No. 6,222,835 (hereinafter "Franz") in view of U.S. Patent No. 6,499,128 (hereinafter "Gerlach") and in further view of U.S. Patent No. 2003/0076890 (hereinafter "Hochwald"). The rejection is respectfully traversed.

Hochwald discloses a multiple transmit and receive antenna system that utilizes iterative decoding. However, Hochwald does not disclose anywhere that "the plurality of modulation symbols for each receive antenna can be a respective modulation or coding scheme" as in claim 1. As with regards to Claim 1, neither Franz nor Gerlach independently or combined teach or disclose all of the limitations of claim 1. Thus, neither Franz, Gerlach, nor Hochwald independently or combined teach or disclose all of the limitations of claim 1. Claim 27 contains similar limitations as to claim 1, and for at least the same reasons as stated for Claim 1, claim 27 is patentable. Claims 28-30, 34-39, and 41-43 depend from independent Claim 27, and are patentable for at least the same reasons as stated with respect to Claim 27.

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E.   CLAIMS 31, 32 AND 45

The Examiner rejected claims 31, 32 and 45 under 35 U.S.C. §103(a) as being unpatentable over U.S. Patent No. 6,222,835 (hereinafter "Franz") in view of U.S. Patent No. 6,499,128 (hereinafter "Gerlach") in view of U.S. Patent No. 2003/0076890 (hereinafter "Hochwald") and in further view of Stefanov (IEEE Journal on Selected areas of Communication, volt 19, No. 5). The rejection is respectfully traversed.

Thus, neither Franz, Gerlach, Hochwald, nor Stefanov independently or combined teach or disclose all of the limitations of claim 1.   Claims 27 and 44 contain similar limitations as to claim 1, and for at least the same reasons as stated for Claim 1, claims 27 and 44 are patentable. Claims 31 and 32 depend from independent Claim 27, and are patentable for at least the same reasons as stated with respect to Claim 27.   Claim 45 depends from independent Claim 44, and is patentable for at least the same reasons as stated with respect to Claim 44.

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Confirmation No. 9458
Examiner: Qutbuddin Ghulamali
Customer No.: 23696

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CONCLUSION

In light of the amendments contained herein, Applicants submit that the application is in

condition for allowance, for which early action is requested.

Please charge any fees or overpayments that may be due with this response to Deposit

Account No. 17-0026.

Respectfully submitted,

Dated: August 23, 2006   By: _____

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